CLAIMS:

1. A piston type compressor comprising:

a suction pressure zone;

a discharge pressure zone;

a rotary shaft;

a piston type compression mechanism, wherein the compression mechanism includes a plurality of cylinders and pistons, wherein each piston is accommodated in one of the cylinders, and defines a compression chamber in the associated cylinder, wherein, as the rotary shaft rotates, each piston draws gas from the suction pressure zone into the associated compression chamber, compresses the gas in the compression chamber, and discharges the gas to the discharge pressure zone;

a plurality of introducing passages, each extending from one of the compression chambers; and

a cylindrical rotary valve located between the suction pressure zone and the introducing passages, wherein the rotary valve rotates synchronously with rotation of the rotary shaft,

wherein the rotary valve has a suction communicating passage and a residual gas bypass passage, wherein, as the rotary shaft rotates, the suction communicating passage consecutively connects, through the corresponding introducing passage, the suction pressure zone with a compression chamber corresponding to a piston in the suction stroke, and wherein the residual gas bypass passage connects the introducing passage that extends from one of the compression chambers in which the discharge stroke has been finished, or a high pressure introducing passage, with the introducing passage that extends from one of the compression chambers the pressure of which is lower than the pressure in the high pressure introducing passage,

wherein each introducing passage has an opening that faces the outer surface of the rotary valve, wherein the

bypass passage has a high pressure opening, and wherein, as the rotary valve rotates, the high pressure opening is consecutively connected with the opening of the high pressure introducing passage,

wherein a peripheral portion of the opening of each introducing passage has a first advancing area, wherein, when the high pressure opening starts to be connected with the opening of the introducing passage, the high pressure opening overlaps the first advancing area, and wherein the first advancing area has a first inclined portion that is inclined relative to an axial direction and a circumferential direction of the rotary valve, and

wherein a peripheral portion of the high pressure opening has a second advancing area, wherein, when the high pressure opening starts being connected with the opening of one of the introducing passages, the second advancing area overlaps the opening of the introducing passage, and wherein the second advancing area has a second inclined portion, and wherein, when the high pressure opening starts being connected with the opening of one of the introducing passages, the second inclined portion extends along the first inclined portion.

2. The compressor according to claim 1, wherein, when the high pressure opening starts being connected with the opening of one of the introducing passages, the entire second inclined portion overlaps the first inclined portion.

3. The compressor according to claim 2, wherein the each first inclined portion has a curved portion, and wherein the second inclined portion conforms to the shape of the curved portions.

4. The compressor according to claim 1, wherein a peripheral portion of the opening of each introducing passage has a first trailing area, wherein, when the high pressure

opening finishes being connected with the opening of the introducing passage, the high pressure opening passes over the first trailing area, and wherein the first trailing area has a first inclined portion that is inclined relative to an axial direction and a circumferential direction of the rotary valve, and

wherein a peripheral portion of the high pressure opening has a second trailing area, wherein, when the high pressure opening finishes being connected with the opening of one of the introducing passages, the second trailing area passes over the opening of the introducing passage, and wherein the second trailing area has a second inclined portion, and wherein, when the high pressure opening finishes being connected with the opening of one of the introducing passages, the second inclined portion extends along the first inclined portion.

5. The compressor according to claim 4, wherein, when the high pressure opening finishes being connected with the opening of one of the introducing passages, the entire second inclined portion overlaps the first inclined portion.

6. The compressor according to claim 5, wherein the each first inclined portion has a curved portion, and wherein the second inclined portion conforms to the shape of the curved portions.

7. A piston type compressor comprising:

a suction pressure zone;

a discharge pressure zone;

a rotary shaft;

a piston type compression mechanism, wherein the compression mechanism includes a plurality of cylinders and pistons, wherein each piston is accommodated in one of the cylinders, and defines a compression chamber in the associated cylinder, wherein, as the rotary shaft rotates, each piston

draws gas from the suction pressure zone into the associated compression chamber, compresses the gas in the compression chamber, and discharges the gas to the discharge pressure zone;

a plurality of introducing passages, each extending from one of the compression chambers; and

a cylindrical rotary valve located between the suction pressure zone and the introducing passages, wherein the rotary valve rotates synchronously with rotation of the rotary shaft,

wherein the rotary valve has a suction communicating passage and a residual gas bypass passage, wherein, as the rotary shaft rotates, the suction communicating passage consecutively connects, through the corresponding introducing passage, the suction pressure zone with a compression chamber corresponding to a piston in the suction stroke, and wherein the residual gas bypass passage connects the introducing passage that extends from one of the compression chambers in which the discharge stroke has been finished, or a high pressure introducing passage, with the introducing passage that extends from one of the compression chambers the pressure of which is lower than the pressure in the high pressure introducing passage,

wherein each introducing passage has an opening that faces the outer surface of the rotary valve, wherein the bypass passage has a high pressure opening, and wherein, as the rotary valve rotates, the high pressure opening is consecutively connected with the opening of the high pressure introducing passage,

wherein a peripheral portion of the opening of each introducing passage has a first trailing area, wherein, when the high pressure opening finishes being connected with the opening of the introducing passage, the high pressure opening passes over the first trailing area, and wherein the first trailing area has a first inclined portion that is inclined relative to an axial direction and a circumferential direction

of the rotary valve, and

wherein a peripheral portion of the high pressure opening has a second trailing area, wherein, when the high pressure opening finishes being connected with the opening of one of the introducing passages, the second trailing area passes over the opening of the introducing passage, and wherein the second trailing area has a second inclined portion, and wherein, when the high pressure opening finishes being connected with the opening of one of the introducing passages, the second inclined portion extends along the first inclined portion.

8. The compressor according to claim 7, wherein, when the high pressure opening finishes being connected with the opening of one of the introducing passages, the entire second inclined portion overlaps the first inclined portion.

9. The compressor according to claim 8, wherein the each first inclined portion has a curved portion, and wherein the second inclined portion conforms to the shape of the curved portions.

10. A piston type compressor comprising:

a suction pressure zone, the internal pressure of which is a suction pressure;

a discharge pressure zone, the internal pressure of which is a discharge pressure;

a rotary shaft;

a piston type compression mechanism, wherein the compression mechanism includes a plurality of cylinders and pistons, wherein each piston is accommodated in one of the cylinders, and defines a compression chamber in the associated cylinder, wherein, as the rotary shaft rotates, each piston draws gas from the suction pressure zone into the associated compression chamber, compresses the gas in the compression chamber, and discharges the gas to the discharge pressure

zone;

a plurality of introducing passages, each extending from one of the compression chambers; and

a cylindrical rotary valve located between the suction pressure zone and the introducing passages, wherein the rotary valve rotates synchronously with rotation of the rotary shaft,

wherein the rotary valve has a suction communicating passage and a residual gas bypass passage, wherein, as the rotary shaft rotates, the suction communicating passage consecutively connects, through the corresponding introducing passage, the suction pressure zone with a compression chamber corresponding to a piston in the suction stroke, and wherein the residual gas bypass passage connects the introducing passage that extends from one of the compression chambers in which the discharge stroke has been finished, or a high pressure introducing passage, with the introducing passage that extends from one of the compression chambers the pressure of which is lower than the pressure in the high pressure introducing passage,

wherein each introducing passage has an opening that faces the outer surface of the rotary valve, wherein the bypass passage has a high pressure opening, and wherein, as the rotary valve rotates, the high pressure opening is consecutively connected with the opening of the high pressure introducing passage, and

wherein the peripheral portion of the opening of each introducing passage and the peripheral portion of the high pressure opening each have a conforming portion, wherein, when the high pressure opening starts or finishes being connected with the opening of the one of the introducing passages, the conforming portions conform to each other, and each conforming portion includes a inclined portion that is inclined relative to an axial direction and a circumferential direction of the rotary valve.

11. The compressor according to claim 10, wherein each inclined portion includes a curved portion.